



**User Manual
&
Spare parts catalogue
for the TP 270 PTO K wood chipper in
the forest series**



1 Introduction

Congratulations on your new TP wood chipper.

Linddana produces TP wood chippers of the finest quality by using the most modern production technologies, i.a. laser cutting, CNC technology and robot technology in bright and open production facilities.

For safety reasons and in order to get maximum pleasure from the wood cutter, it is important to read these instructions before use.

The user manual explains about safety, use and maintenance so that the work with the wood chipper will be safe and profitable.

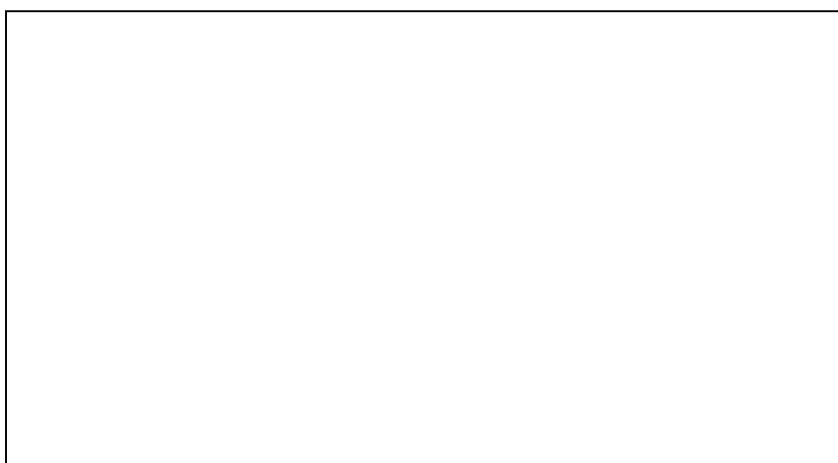
This manual has been translated from Danish.

Linddana A/S



Jørgen Due Jensen, Managing director

Your distributor is always available with spare parts, advice and guidance.



Distributor stamp

2 EU declaration of conformity.

**Manufacturer:**

LINDDANA A/S, Ølholm Bygade 70, Ølholm, 7160 Tørring, Denmark
hereby declares that

Wood chipper:

is in concordance with the provisions of the Machine Directive (Directive 06/42/EC) and with the national legislation which translates this directive;

is in concordance with the following other EC Directives:
2000/14/EC

Furthermore it is stated that
EN 13525 (harmonised standard), has been used.

Title: Managing director
Name: Jørgen Due Jensen

A handwritten signature in black ink, appearing to read 'Jørgen Due Jensen', is written over a light blue grid background.

Ølholm, 03 November 2015

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4 Use

The TP 270 wood chipper is designed for **stationary** wood chipping in the form of braches, bushes and wood refuse from windbreak, parks, trees along roads etc.

The machine must **not** be used for materials containing stone, metal or other foreign bodies. These foreign bodies can in the best case dull the knives and in the worst case break the machine. Knives and anvil can break when stone or metal comes in between them.

The machine must **not** be used for wood chipping of wood containing nails, screws, arming etc.

When feeding branches you must stand next to the feeding hopper (see Figure 1).

The branches can be thrown around when the retract rollers get a hold of them.

Logs must be fed into the machine from the back (see Figure 2).



Figure 1 Feeding branches



Figure 2 Feeding logs

Remember to keep the **knives** and **anvil** sharp, it makes feeding easier and gives a better quality chips, and besides it lowers the use of fuel considerably.

The machine must be inspected daily, meaning the rotor housing must be opened and the rotor, knives, anvil etc. must be inspected. By doing this you prevent unexpected stops and prolong the life of the machine.

The tractor upon which the machine is mounted must always have the brakes activated during work.

The machine must **not**:

- Be used for other materials than wood
- Be used to push trees, stubs etc.

There must **not** be equipment like forest chains, axes, chain saws etc. in the feeding hopper.

5 Mounting instructions

5.1 Before use

The machine is equipped with a lifting point which is to be used when lifting the machine with a crane or any other hoisting device (ground assistance) (see Figure 3). The machine can also be lifted with a fork lift truck. This has to be done with great care as the machine might tip over (see Figure 4).

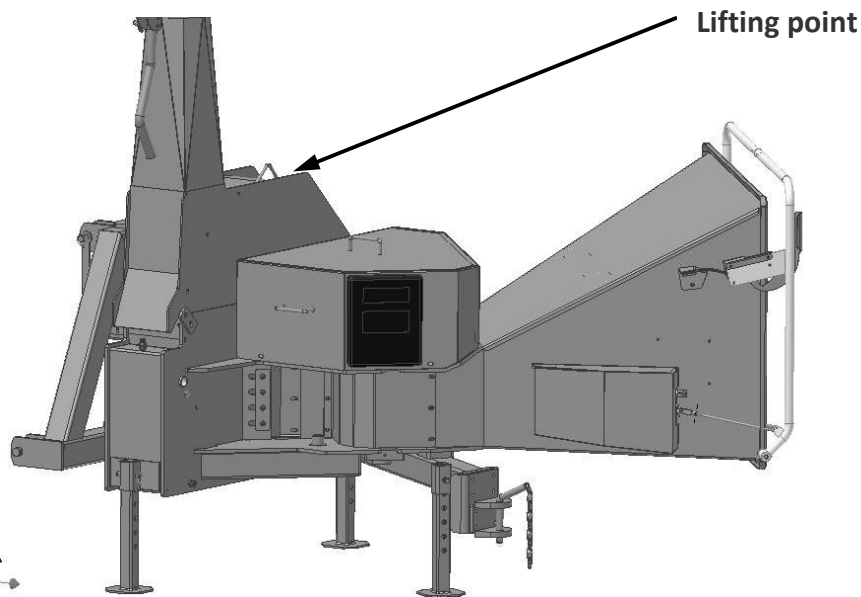


Figure 3 Lifting point on the machine



Figure 4 Lifting with a fork lift truck

Store the manuals for the PTO member with this manual in the manual box on the machine.

Before operation you must check that the wood chipper cleared of foreign bodies. The machine **must** be uncoupled from the tractor's PTO before opening for the rotor. Check that the rotor is at a complete standstill. Turn the ejector tube so that it faces the opposite direction of the rotor housing (see Figure 5). Loosen the bolts that hold the upper and lower rotor housing together. Lift the top part of the rotor housing up until the ejector tube rests on its own. Turn the rotor a few times by hand. Remove any foreign bodies.

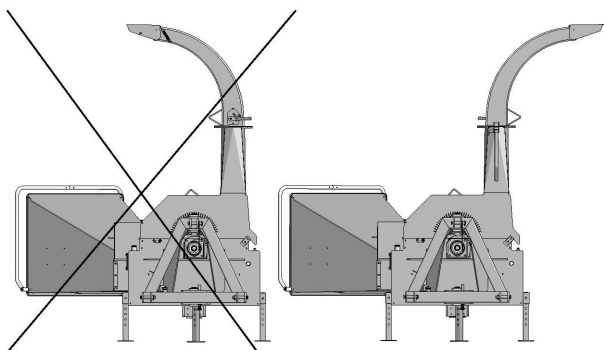


Figure 5 Position of ejector tube when opening rotor

Check that the gap between the knives and the anvil is correct = **1 mm**. The knives have a fixed **knife position = 12mm**. Check that the knives are not rubbing on the anvils.

Lift the top part of the rotor housing back in place and tighten the bolts (see Figure 15).

Check that all bolts, nuts and screws are tightened properly.

Remember to lubricate all the lubrication points (see maintenance schedule, page 16).

Old hydraulics and motor oil and used oil filters and air filters must be handed in at an approved receiving station.

5.2 Mounting instructions

The machine is designed to be mounted on the tractor's three-point-suspension.

The machine is delivered with a PTO axle with either 1 3/8" - 6 splines or 1 3/8" - 21 splines.

At 1000 rpm, certain types of tractors a PTO axle with 1 3/8" - 21 splines must be used.

The PTO axle **must** be mounted with free running on the machine side.

Linddana uses Walterscheid 2500 with free running which comes with the machine.

The length of the PTO axle has to be adapted to the tractor following instructions from the supplier of the PTO axle. See the attached manual for the PTO axle.

The machine must stand on a plane, horizontal surface during use. The wood chipper must be attached to the tractor's three-point-suspension. The tractor's brakes must be properly activated.

When starting the machine: Engagement must be done with the motor running at idle speed or at as few revolutions as possible in order to avoid overloading of the PTO axle, gear box, tractor and wood chipper.

6 Safety instructions

6.1 Safety regulations

- Use hearing protectors, safety goggles or a similar eye protection, close fitting safety clothing and safety shoes.
- When working near roads it can be prudent to wear a vest which reflects the light to be more visible to the other road-users. The displaying of signs must be in accordance with the Road Traffic Act.
- Minimum age for users of the machine is 18, for training and under surveillance from an adult the age is 16.
- During operation, all body parts must be kept away from the feeding hopper and any moveable parts of the machine.
- Always stand next to the feeding hopper during feeding of the machine. Always observe the terrain conditions around the machine. It can be dangerous to fall near the machine!
- Before starting the machine check that the safety devices are working properly. Especially the stop and return functions on the operation bow.
- The machine **must** not be started without the ejector tube mounted to the machine.
- **Never** use the machine in closed or poorly ventilated spaces, because of the danger of carbon monoxide poisoning.
- The top part of the machine as well as all other shielding must **not** be opened/removed before the rotor disc is completely immovable and the tractor's motor is stopped.
- **Always** stop the machine and the tractor during inspections, service or repairs. The machine **must** be uncoupled from the tractor's PTO.
- Tractor mounted machines have to be on the ground before service or repairs are done.
- Always remove the keys from the machine and/or the tractor before leaving it.
- After maintenance and repairs, the machine must not be started before all bolts are tightened and all safety devices are mounted.
- Three-point mounted machines **must** be coupled to the tractor's three-point- suspension before use.
- The maximum rpm for the machine (1000 rpm) must **not** be superseded.
- The transmission axle's tube shielding and covering must always be intact. Safety chains on the transmission axle have to be properly mounted.
- The length of the PTO axle has to be adapted to the tractor according to the recommendations from the supplier of the PTO axle.
- The ejector tube must **not** point towards people or areas where there are people. There is a safety distance of 20 m. in the direction where the chips are thrown.
- **AT DANGER: PUT THE OPERATION BOW IN NEUTRAL (See Figure 8).**
- During operation the machine's height may not supersede 600 mm over the terrain (see Figure 6). If this height is not maintained the operation/safety handle will not work as it should, and that may lead to risks of severe personal injury due to retraction.

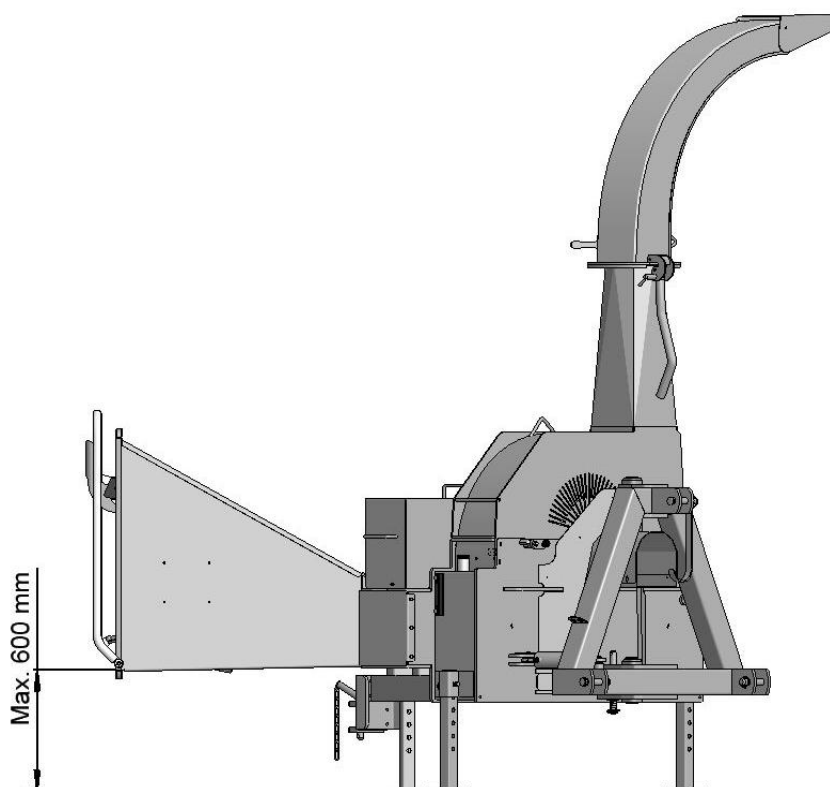


Figure 6 Maximum height over the terrain


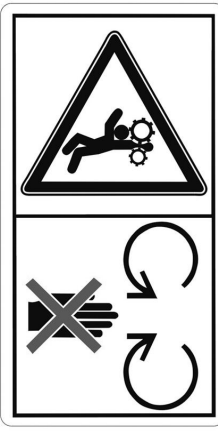


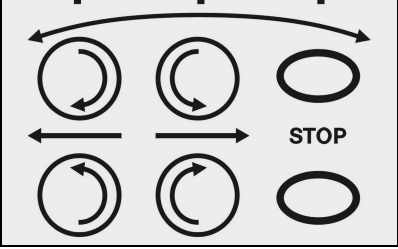


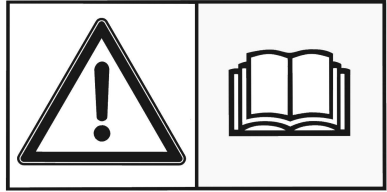



- During transport or when the machine is dismantled, the PTO axle has to be placed in the machine's carrier bow.
- In case of transport on roads the ejector tube is turned so it is placed appropriately within the width of the machine and then it is fixed securely.
- During transport on public roads, the provisions of the authorities must be respected.
- The machine is equipped with a retractable hopper which must be tipped up and secured with a split pin during transport.
- The legs of the machine are pulled up and secured with a split pin during transport.
- During cleaning of the hopper, **THE RETRACT ROLLERS MUST BE STOPPED.**
- For cleaning a broom or similar **must** be used. Never touch the inside of the hopper when the machine is running.

SPECIAL: TP 270 PTO K / TP 270 PTO K FRONT


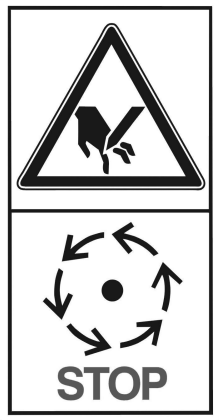



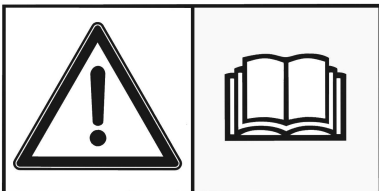


- The machine must **not** be fed by hand since it has been designed for feeding by a crane.
- There is a security zone of 20 m around the tractor and the wood chipper. During operation no one except the driver of the tractor is allowed in this area.
- If people should come inside the security zone by accident, the emergency stop which stops all movement by the crane and feeding into the wood chipper must be pressed **immediately**. The emergency stop should **always** be activated when the driver leaves the driver's cab.
- **AT DANGER: AKTIVATE THE EMERGENCY STOP IN THE TRACTOR**

6.2 Pictograms used

TP 270 PTO / TP 270 PTO FRONT

		
<p>Warning: Objects thrown! Safety distance 20m!</p>	<p>Warning: Rotating knives! Wait for rotor to stop!</p>	<p>Warning: Rotating rollers!</p>
		
<p>Warning: Danger of retraction! Do not touch the hopper!</p>	<p>Warning: Danger of retraction! Do not step on the hopper!</p>	<p>Functions of the operation bow</p>
	 <p>(Only for TP 270 PTO Front)</p>	
<p>Warning: Max 1000 rpm, anti-clockwise direction of rotation!</p>	<p>Warning: Max 1000 rpm, clockwise direction of rotation!</p>	<p>Read the manual before use!</p>
		
<p>Lifting point for fork lift truck</p>	<p>Hearing protector and eye protection prescribed!</p>	<p>Lifting point for crane!</p>

TP 270 PTO K / TP 270 PTO K FRONT

		
<p>Warning: Objects thrown! Safety distance 20m!</p>	<p>Warning: Rotating knives! Wait for rotor to stop!</p>	<p>Warning: Must not be hand fed!</p>
	 <p>(Only for TP 270 PTO K Front)</p>	
<p>Warning: Max 1000 rpm, anti-clockwise direction of rotation!</p>	<p>Warning: Max 1000 rpm, clockwise direction of rotation!</p>	<p>Read the manual before use!</p>
		
<p>Lifting point for fork lift truck</p>	<p>Lifting point for crane!</p>	

6.3 Noise level

The sound effect level and the sound pressure level from the wood chipper have been measured during use at 1000 rpm on the rotor disc, powered by a tractor.

The measurements have been conducted according to test provisions

Directive 2000/14/EC, 3. July 2000

EN ISO 3744, 1995

ISO 11201, 1995

ISO 4871, 19. March 1997

EN 13525, 17. February 2005

The warrantyd sound effect level which will be given by the manufacturer according to directive 2000/14/EC is as follows:

TP 270 wood chipper: 121 dB (A) re.1pW.

The machine's sound pressure level at the operator's seat is measured according to ISO 11201 at:

TP 270 wood chipper: 104 dB (A)

The above mentioned values have the common uncertainty for the method of measuring and the estimated variation in a product line for the type of machine. Detailed information on the measurements and results as well as estimation of uncertainty are found in a thorough report which can be given out on demand.

The sound level is of such a character that hearing protectors are prescribed during use of the machine.

6.4 Environmental instructions

When changing hydraulic oil or engine oil, oil and used oil filters and air filters must be handed in at an approved receiving station.

Oil spills must be avoided as much as possible. At oil spills, the spilled oil must be cleaned up and handed in at an approved receiving station.

Worn out parts must be disposed of for recycling.

When the machine is worn out it must be disposed of properly. Hydraulic oil and engine oil must be drained and handed in at an approved receiving station with oil filters and air filters.

The rest of the machine must be disposed of for recycling.

7 Operation of the machine

The wood chipper is equipped with two hydraulic rollers, a pressure compensated flow valve, a control valve and an operation bow with a reset handle (see Figure 7).

The operation bow must be in the stop position (0) during start (see Figure 8). After start you release the reset handle and pull the operation bow into the middle position (A) and the rollers will turn. The material is now pulled into the machine.

By pulling the operation bow towards you (B), the flow of oil in the control valve is turned and the rollers reverse, the material is now pushed out of the machine.

When the machine is either stopped (0) or reversed (B), the reset handle will automatically block the operation bow. It is now necessary to release the reset handle before the operation bow can be moved into the middle position (A) and the rollers can pull the material into the machine. This reset handle is a safety measure so you cannot start the rollers by accident so they pull material into the machine.

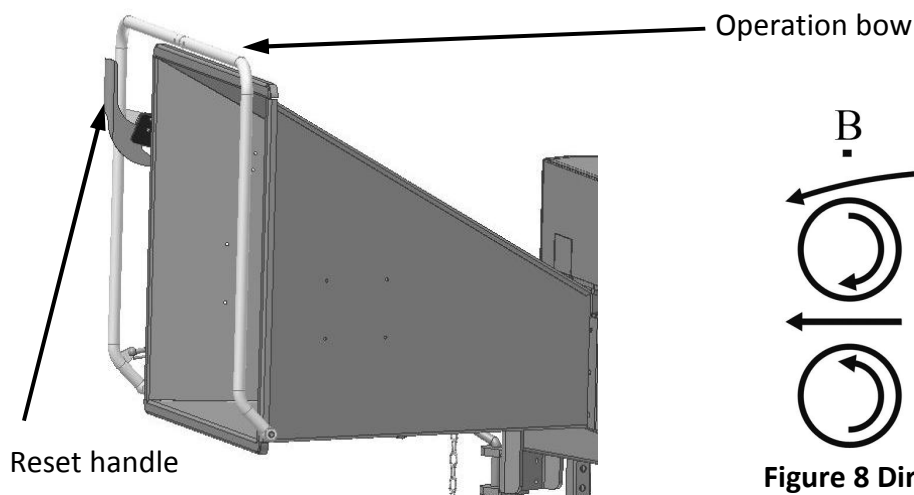


Figure 7 Feeding hopper TP 270 PTO with operation bow and reset handle

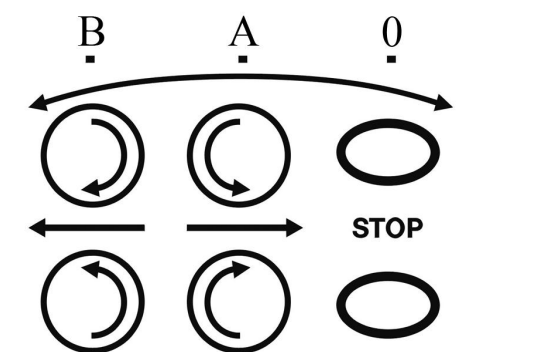


Figure 8 Direction to the operation bow

By turning the adjusting screw on the flow valve you can find the correct rpm. Never go too fast with the rollers because the wood will work like a brake if the pressure on the rotor is too big with the ensuing increase in use of fuel. Branches can get wrapped around the rollers if the rpm is too high.

In the table below (Table 1) are stated the recommended rpm on the retract rollers at a desired chip length. The speeds vary with the number of revolutions on the PTO axle. The chip length can be regulated on the flow-regulation valve on the wood chipper for smaller chip lengths than indicated in the table.

TP 270 PTO / TP 270 PTO FRONT

Can be put in two positions as shown (see Figure 9). Pull the cord which is tied to the transport lock and activate the cylinder which swings the machine. Let go of the cord and check that the transport lock is back in the locked position.

The trailer coupling on the machine must not be used on public roads.

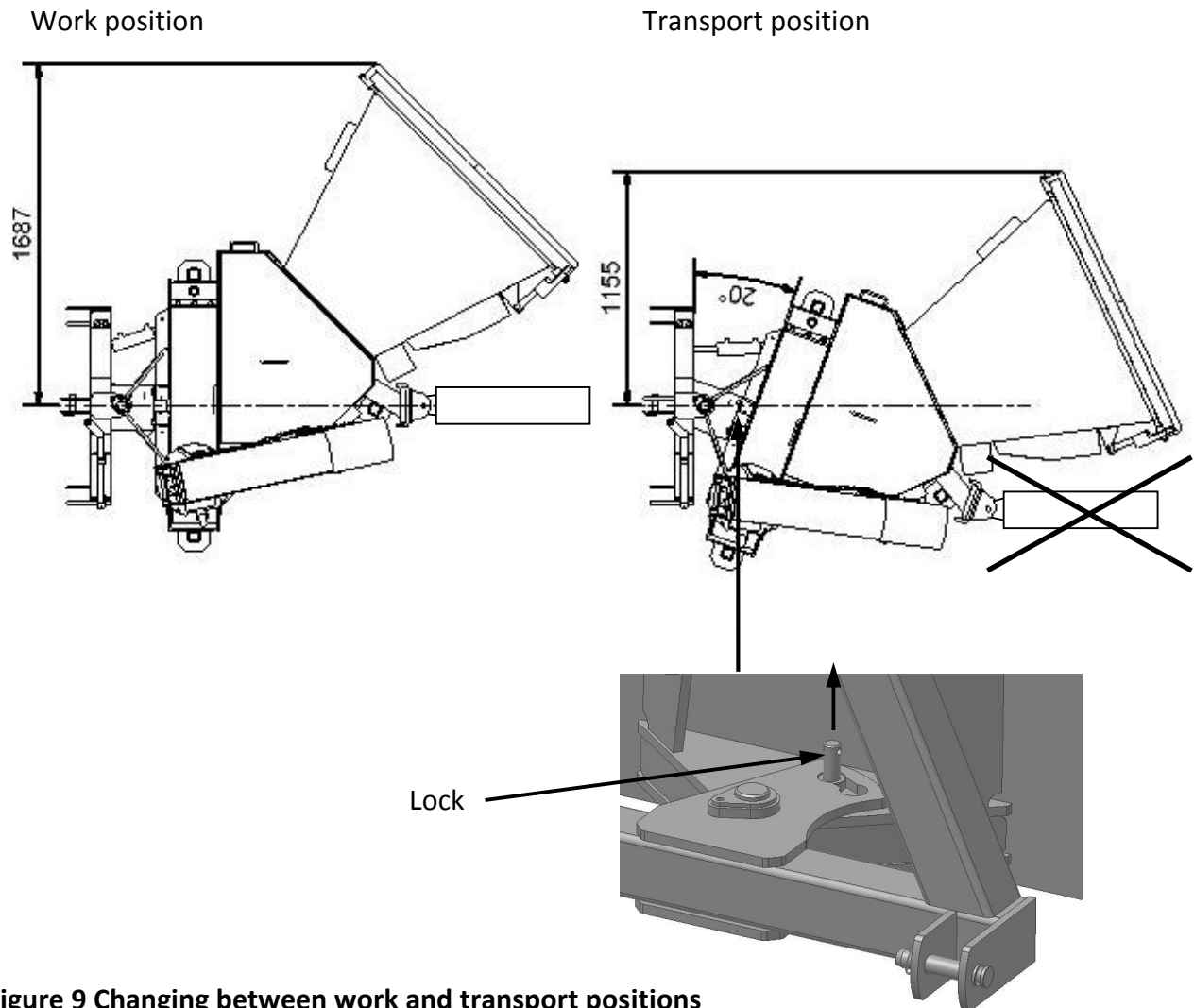
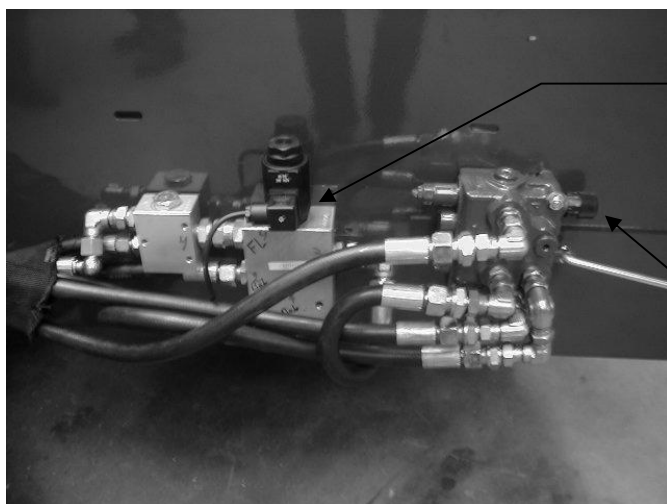


Figure 9 Changing between work and transport positions

7.1 Table 1 Setting the rpm for the retract rollers

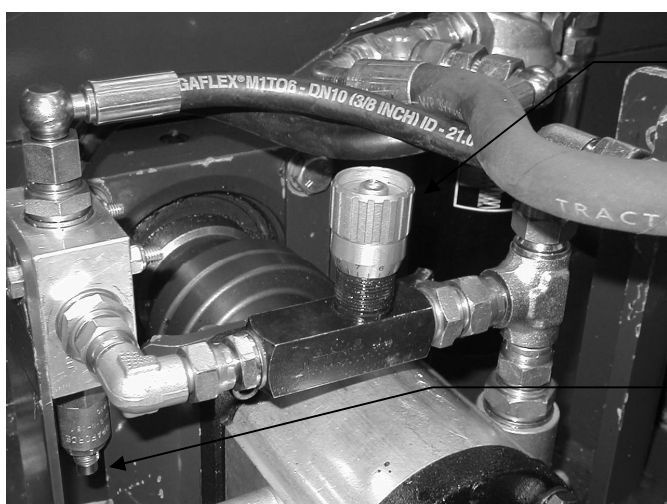
TP 270 (3 knives)				
Knife distance	At 1000 rpm	<i>theoretical m/min</i>	<i>theoretical m/min</i>	Chip length mm
15	78	64	34	21
12	62	51	28	17
10	52	42	23	14
8	42	34	18	11



Accessory for the TP
PILOT

Regulating the
speed of the

Figure 10 Setting the speed of the rollers, TP 270 PTO / PTO FRONT



The one-way restrictor keeps pressure on the cylinder for the revolving roller! Operation: Closed (maybe 1/3 open). Service: To release the revolving roller, open the restrictor. Remember to close again!

Regulating pressure on cylinder. Max. 70 Bar
Remember to tighten the counter nut.

Figure 11 Setting the pressure on the cylinder, TP 270 PTO / PTO FRONT



Regulating roller speed.
Remember to tighten the counter nut

Regulating pressure on cylinder.
Max. 70 Bar
Remember to tighten the counter nut

Figure 12 Setting the speed of the rollers, TP 270 PTO K / PTO K FRONT

8 Maintenance

During all maintenance and repairs the machine and the drive must be shut off. Tractor mounted machines have to be placed on an even surface and be uncoupled from the tractor's PTO.

8.1 Maintenance schedule

Interval=> hours	8 ⌘	50 ⌘	100 ⌘	200 ⌘	1000 ⌘	1.000 m ³	10.000 m ³
Lubrication of the PTO axle ¹	X						
Check of knives and anvil	X						
Tightening of all nuts and bolts ²	(X)	X					
Lubrication of main bearings for rotor disc ³			X				
Tube connection for PTO axle cleaning/lubrication ⁴				X			
Lubrication of roller bearings ⁵				X			
Changing of return filter for hydraulic pump ⁶		(X)			X		
Change hydraulic oil ⁷					X		
Anvil turn/change ⁸					X		
Change bow in top rotor housing ⁹					X		
Turn/change triangle and square scrapers ¹⁰						X	
Grind retract rollers ¹¹						X	
Check ejector wings for wear					X		
Check casing for wear and tear							X

¹ The PTO axle is dismantled and 4 lubrication nipples are lubricated with Uniway Li62 or something of similar quality.

² Bolts and nuts are tightened, the first time after 8 hours and then with an interval of 50 hours.

³ Two lubrication nipples are lubricated with Uniway Li62 or something of similar quality.

⁴ The PTO axle is dismantled and the tube connection is pulled apart, cleaned and lubricated.

⁵ Two lubrication nipples are lubricated with Uniway Li62 or something of similar quality.

⁶ Changed for the first time after 50 hours and then every 1000 hours.

⁷ Drain the hydraulic oil and fill with new oil using 52 litres of **Hydraway HVXA 46** or oil that has the equivalent specifications. The interval between changing oil can be extended by using biodegradable hydraulic oil, such as the type **Hydraway SE 46 HP** and taking oil samples on an ongoing basis.

⁸ The anvil is turned/changed depending on need.

⁹ The bow in the top rotor housing is changed depending on need if it is mounted.

¹⁰ The triangle scraper in the rotor housing is turned/changed. The square scraper on the rotor is turned/changed.

¹¹ The retract rollers are sharpened.

8.2 Lubrication and oil

The Wood Chipper is as standard, factory-filled with hydraulic oil of the type **Hydraway HVXA 46**. When replacing the oil, use the same type of oil or oil with equivalent specifications. Do not mix together different types/brands of oils.

As an accessory, the Wood Chipper can be delivered factory-filled with biodegradable oil of the type saturated ester, **Hydraway SE 46HP**. When replacing the oil, use the same type of oil or oil with equivalent specifications. Do not mix together different types/brands of oils.

Old hydraulic oil and engine oil as well as used oil filters and air filters should be handed in to the local receiving station.

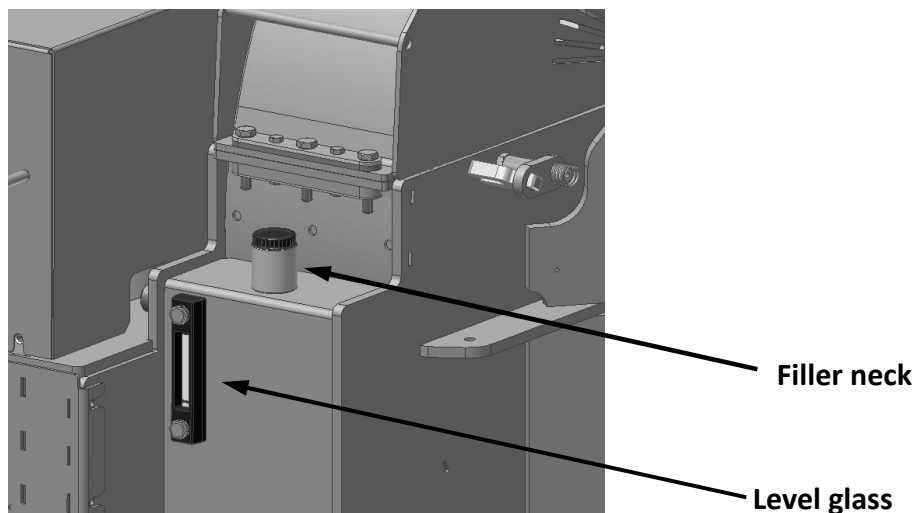
Lubrication nipples are lubricated according to the maintenance schedule with Statoil **Uniway Li62** or a similar product.

The machine is equipped with a hydraulic oil tank which is integrated in the rotor housing. The tank is equipped with a filler neck, an air release valve, a level glass, a drain plug and a return filter.

When changing the hydraulic oil, the filler neck is opened (see Figure 13)

The drain plug is unscrewed. The oil is drained into a canister for proper removal. When the tank is almost empty, the tank is sucked empty with an oil suction device. The drain plug is screwed back and new hydraulic oil is slowly filled in (52 litres for TP 270).

Oil is filled in until the level glass is half filled (working temperature).



8. Figure 13 Level glass and filler neck

8.3.1 Anvil

The anvil in the machine is used as wearing bar for the knife in order to cut the wood. The anvil must be sharp-edged otherwise the wood will bend down and the cut will become frayed. The

machine is equipped with one horizontal anvil with two edges and one vertical anvil with four edges. Both anvils can be turned.

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill. Turn the ejector tube so it faces the opposite direction of the rotor housing (Figure 5). Loosen the bolts which hold the two parts of the rotor housing together and open the rotor housing.

Dismantle the three bolts which hold the horizontal anvil. This is done from the outside and from below. The anvil is taken out and turned/replaced. Before the anvil is put back, the anvil and the bearing surface must be cleaned carefully. The distance between the knife's edge and the anvil must be **1 mm**. (See Figure 14).

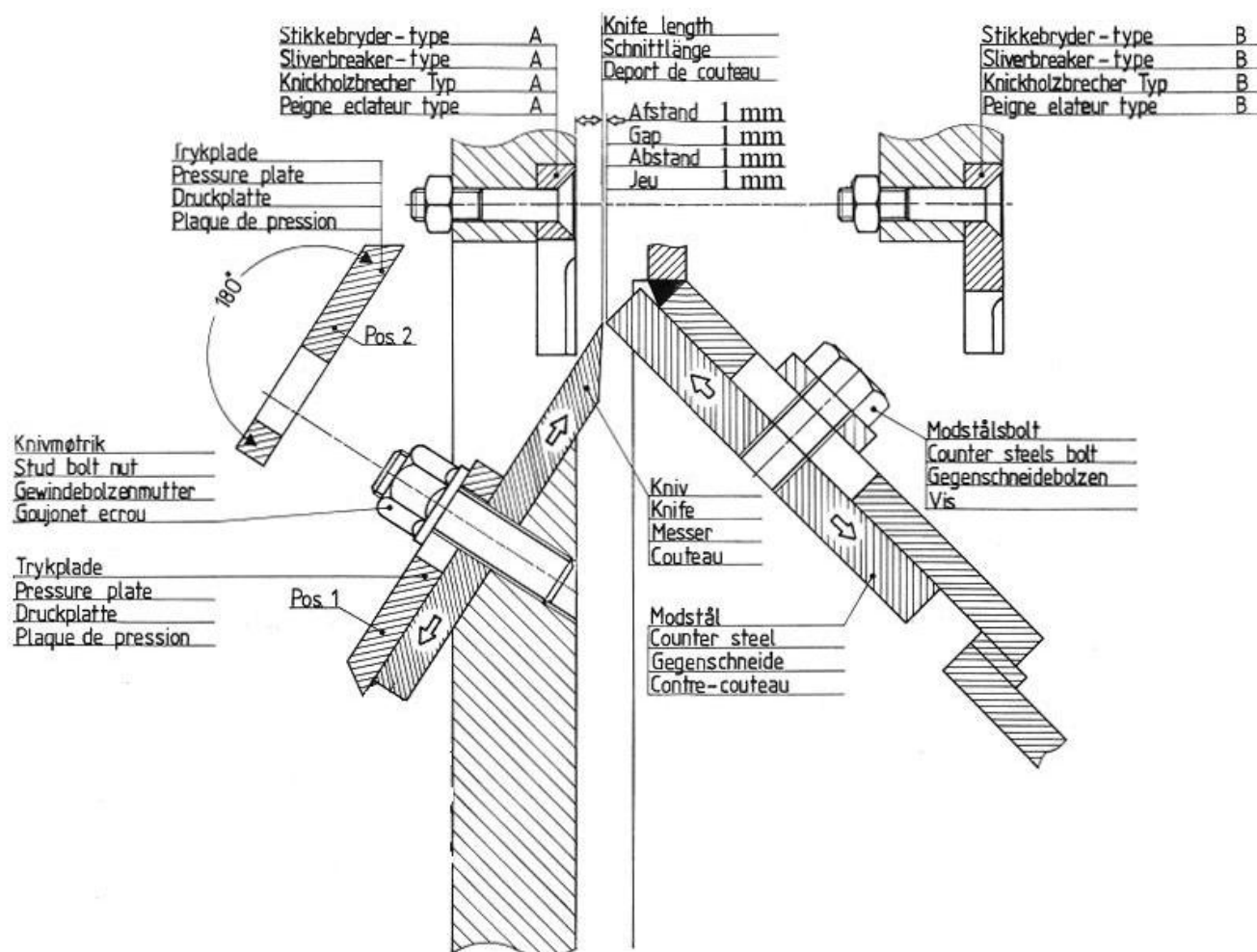


Figure 14 Distance between anvil and knife

The tightening factor for the bolts for the anvils is **200 Nm / 20 Kpm**.

A torque wrench is included in the tool kit (can be bought as accessory).

The vertical anvil is unscrewed and removed from the inside. Before a new one is put in, the anvil and the bearing surface must be cleaned carefully. The anvil is set to a distance of **1 mm** to the

knives. Use a new precision feeler gauge. The bolts for the vertical anvil are tightened to **200 Nm / 20 Kpm**.

Turn the rotor a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and tighten the bolts (see Figure 15).

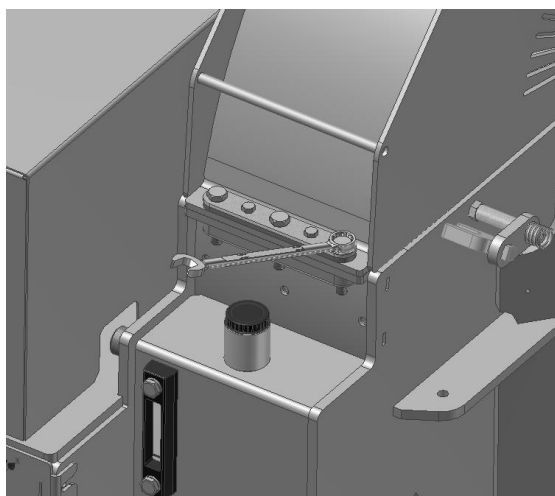


Figure 15 Fixing bolts in the rotor housing

8.3.2 Knives

The machine is equipped with three knives.

The knives must always be changed in sets. The knives belong together in sets, also when they are ground so that they are always of equal width. If the knives are not of equal width the rotor will be out of balance which will lead to unnecessary strain on the bearings and vibrations in the whole machine.

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill by looking at the two-coloured axle end. Turn the ejector tube so it faces away from the rotor housing (Figure 5) Loosen the bolts which hold the two parts of the rotor housing together and open the rotor housing.

The rotor is turned until the fork of the rotor lock covers one of the ejector wings on the rotor. Now the rotor is locked (see Figure 16). Be careful that your fingers are not near the knives when the rotor is turned.

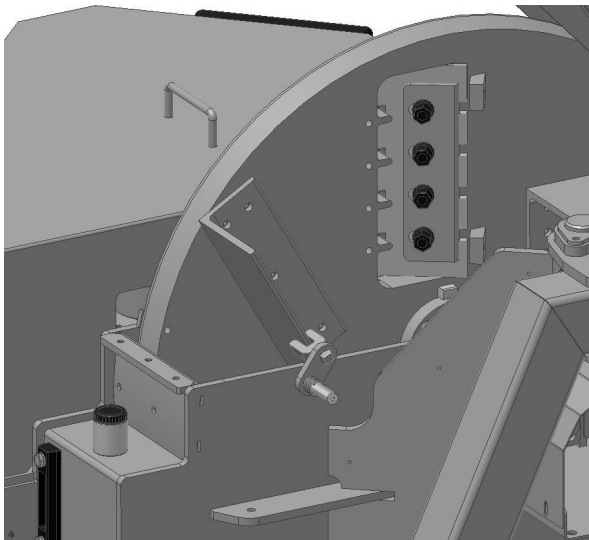


Figure 16 Locking the rotor



Figure 17 Knife measurer

Remove the four nuts which hold the knife to the rotor. Take out the knife and sliver breaker. The bearing surfaces on the chipping disc, the knife and the sliver breaker must be cleaned properly before fitting the knives. On fitting, the nuts **must** be slightly greased ($\mu=0,125$) meaning thin oil, WD 40 or something similar. Copper grease, MoS_2 or similar low friction grease must **not** be used.

When fitting, a knife measurer is used (see Figure 17) in order to set the correct distance of the knives. The knife measurer is found in the manual box on the machine.

Check that the distance between the knife's edge and the anvil is set correctly at **1 mm**.

The nuts must be tightened with **200 Nm / 20 Kpm**. (Use a torque wrench for this which is included in the tool kit. This can be bought as an accessory).

Turn the rotor a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and tighten the bolts (see Figure 15).

8.3.3 Sliver breakers

In order to increase the quality of chips, the machine is equipped with sliver breakers type A from the factory (see Figure 18).

When chipping hard dried wood, sliver breaker type B is used (see Figure 19).

Sliver breaker type B is an accessory.



Figure 18 Sliver breaker Type A



Figure 19 Sliver breaker type B

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a complete standstill. Turn the ejector tube so it faces away from the rotor housing (Figure 5). Loosen the bolts which hold the two parts of the rotor housing together and open the rotor housing. Remove the nuts and bolts which hold the sliver breaker in place (see Figure 20).

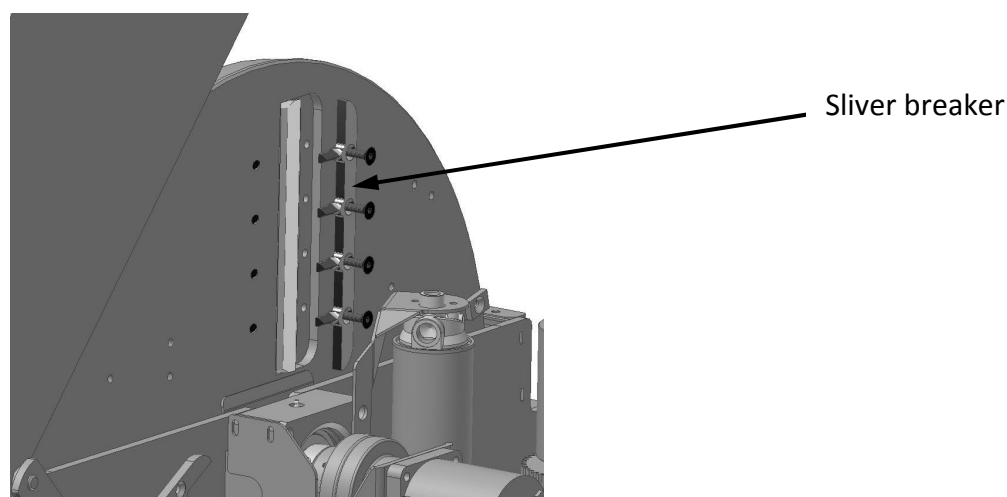


Figure 20 Fitting sliver breaker

When using sliver breaker type b, the knife distance must not supersede **8 mm**.

When the sliver breakers are dismantled or changed, the rotor is turned a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and tighten the bolts (see fig. 16).

8.3.4 Scrapers and facing plate

The machine is equipped with three square scrapers (see Figure 22) on the rotor disc, a triangle scraper in the rotor housing and a facing plate in the ejector tube (see Figure 21):

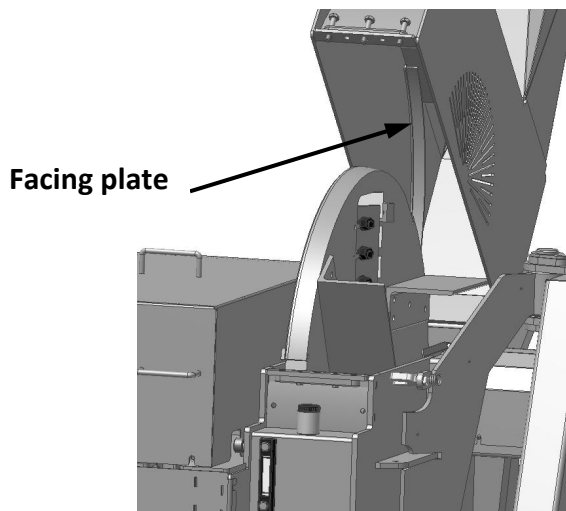


Figure 21 Placement of the facing plate

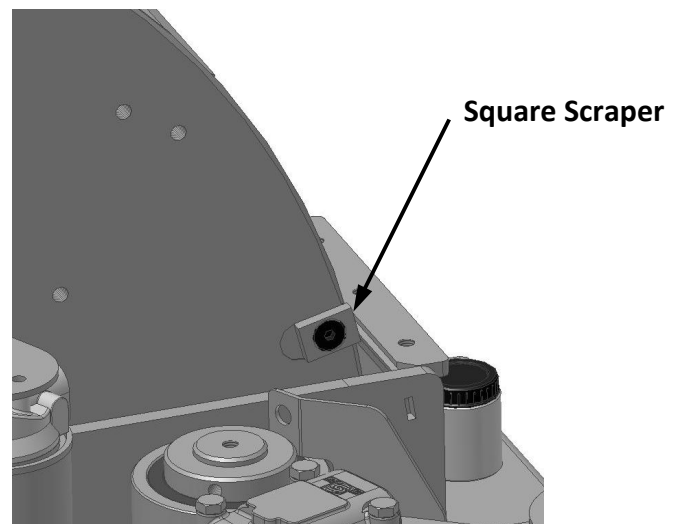


Figure 22 Placement of the square scraper

The purpose of the scrapers is to remove any material which might get stuck to the knives. At the same time the square scraper on the rotor removes material which falls off in front on the chipping disc.

This reduces the wear to the casing and reduces the consumption of fuel.

The square scrapers can be turned once before being changed, while the triangle scraper and the facing plate should always be changed when they are worn.

This is how it is done:

The rotor is turned until the fork of the rotor lock covers one of the ejector wings on the rotor. Now the rotor is locked (see Figure 16).

Dismantle the countersunk bolts which hold the square scraper on the rotor. Turn the square so that a sharp edge points up. Clean the block and the bearing surface. Put the square scraper back. If it is worn on two edges, the square scraper has to be changed. Always change the square scraper on the rotor in sets. Change the triangle scraper when it is worn.

The facing plate is mounted in the top part of the rotor housing and can easily be changed by dismantling three bolts on the outside of the rotor housing. If chip quality is not important the facing plate in the ejector tube can be removed. This will increase the capacity of the machine and save fuel. The facing plate has to be dismantled when chipping wet conifer with a lot of needles. Then a good ejection is ensured.

When the scrapers have been turned or changed, the rotor is turned a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and tighten the bolts (see Figure 15).

8.3.5 Casing

The TP 270 is equipped with an interchangeable casing at the bottom of the rotor housing. The casing absorbs the wear and tear which would normally happen at the bottom of the rotor housing.

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill. Turn the ejector tube so it is pointing away from the rotor housing (see Figure 5) Loosen the bolts which hold the two parts of the rotor housing together and open the rotor housing. Remove the top part of the rotor housing.

Dismantle the six bolts and nuts which hold the casing to the bottom part of the rotor housing (see Figure 23).

Hit with a hammer on the part of the casing which sticks up over the edge of the rotor housing at the hinge side to loosen the casing. Now the casing can be swung out.

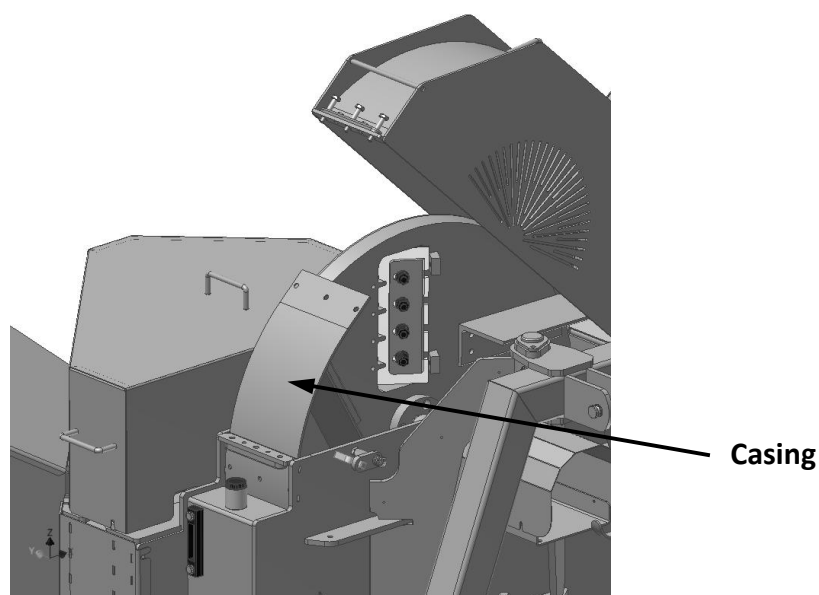


Figure 23 Changing the casing

Before a new casing is put in, you must clean the bottom of the wood chipper. Mount the new casing with six bolts. Put the top part of the rotor housing back.

When the casing has been changed the rotor is turned a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and tighten the bolts (see Figure 15).

8.4 Grinding of knives

It is very important for the quality of chips that the knives are sharp. They have to be checked at least once a day. The grinding interval of the knives can be prolonged by grinding them with a carborundum stone regularly.

The grinding can be done as wet grinding with a bond stone (see Figure 24). **Never** use an angle grinder or a similar tool for grinding the knives.

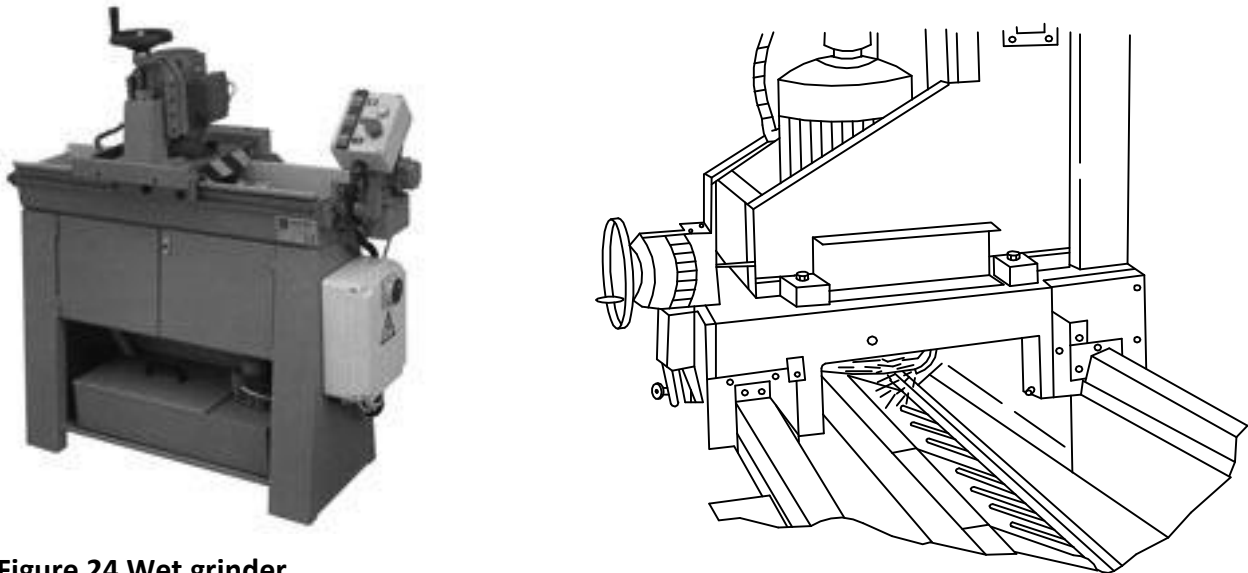


Figure 24 Wet grinder

When grinding knives you have to pay attention to the width of the knife set. The width has to be the same because of the balancing of the rotor. Therefore, the knives always have to be ground in sets. The knives must have a measurement of min. 106 mm (See Figure 25). After that they must be thrown away.

The edge of the knives must be ground at an angle of 30°. (See Figure 25).

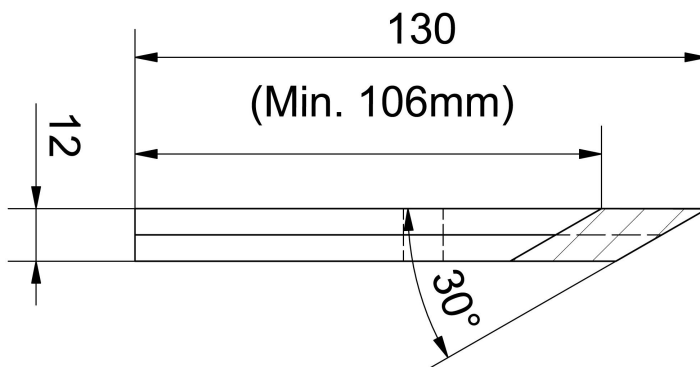
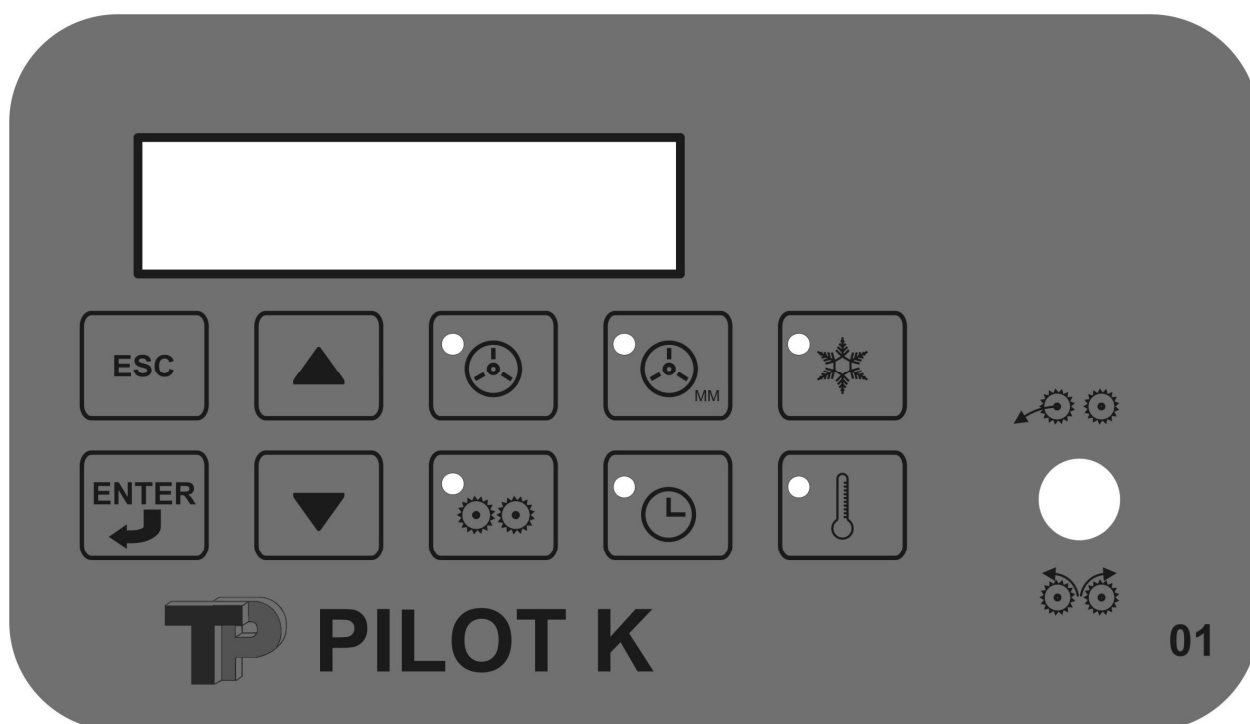


Figure 25 Grinding angle and minimum knife width for chipping knives

9 Instruction for TP PILOT K



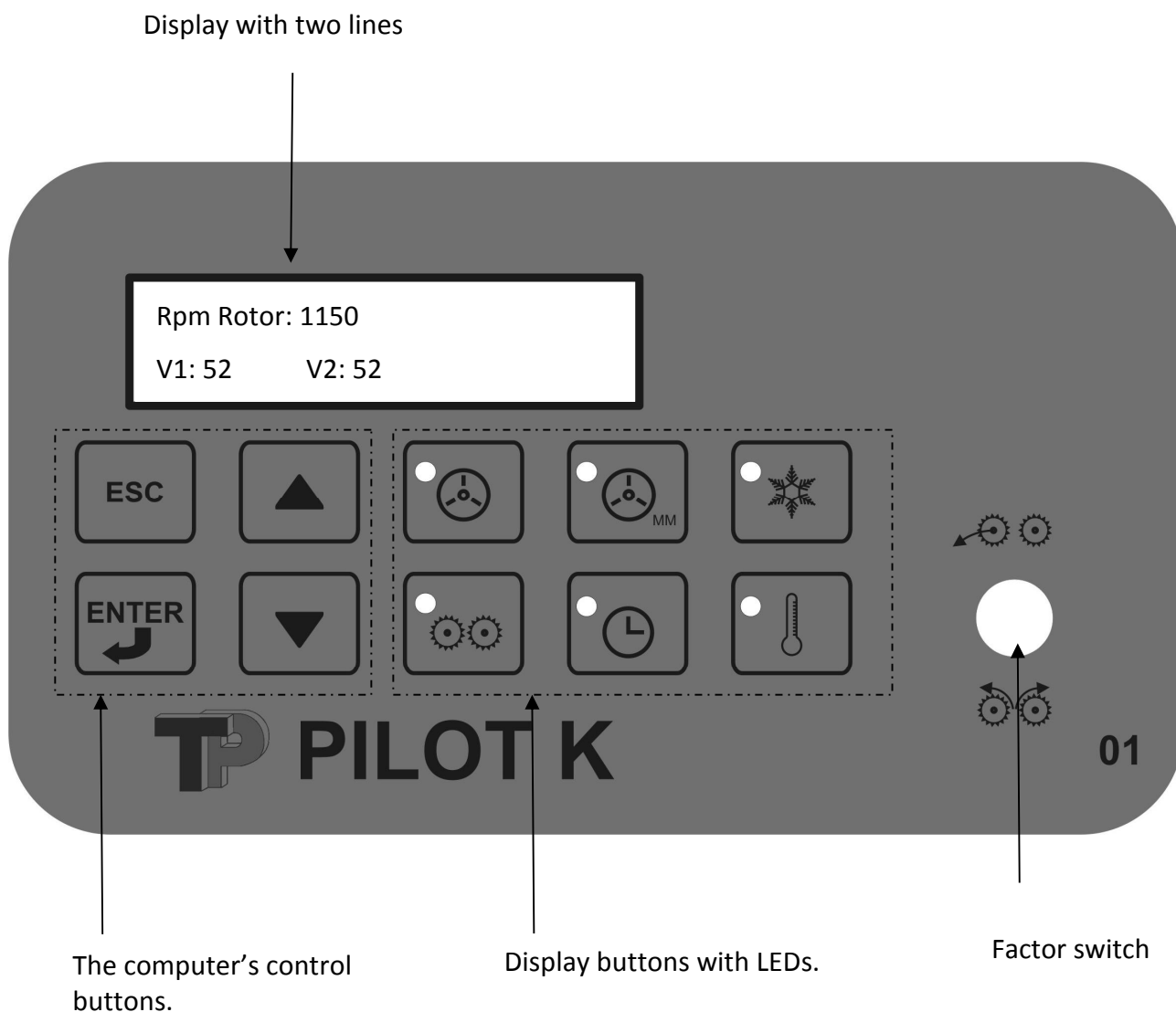
Overall description of the system:

During normal operation of the machine, the desired chip size is set by setting the position of the knives and punching in the setting of the knives followed by a calibration of the rollers. The wood chipper can now be used by putting the rpm of the knife over the set start value where the rollers start pulling in wood material. As long as the rpm of the rotor are between the low and high limit value, the rollers will rotate so the material between the rollers will be pulled toward the knives. The rpm of the rollers will be adapted to the rpm of the knives so the desired chip size is maintained.

It is recommended that the 12 V power supply is run through an emergency stop button which removes the power supply to the PILOT K and the crane.

9.1 Description of the TP PILOT K control panel.




Below is an overview of the control panel for the control with specification of the placement of the buttons and switches.



9.1.1 Display

Overview of all the control's displays and descriptions of every display are found in appendices 1 and 2.



Setting the display contrast:

The display contrast is set by holding the  button in while pushing the  button or the  button.

Work display.

The work display shows the rpm of the rotor and the two rollers.
On type TP 250, only the roller rpm is shown.

Rpm Rotor: 1150	
V1: 52	V2: 52

By pushing the  button or the  button the display changes between the following displays:

- Showing the rpm of the rotor.

Rpm Rotor
1150

- Showing the rpm of the rollers. On type TP 250, only one roller rpm is shown.

Rpm Rollers	
V1: 52	V2: 52

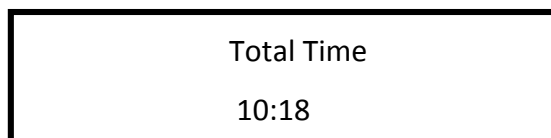
- Showing the set knife setting in millimetres. Possibility for changing the value.

Knife setting	
12	ENTER

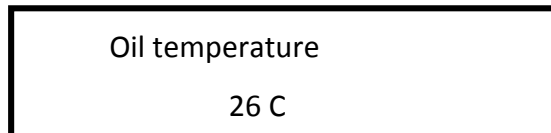
- Showing the time for the present job. It is shown in hours and minutes. Possibility for resetting.

Job Time	
1:48	ENTER

- Showing the total work time of the machine. It is shown in hours and minutes.







- The current temperature of the oil in Celsius. (Accessory)









The displays shown are also available through a specific display button described below.
(See also Appendix one; User display).

9.1.2 The computer's control buttons.

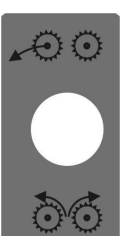
The computer's control buttons are described below.

 	Display change and changing entry values.
	ENTER button. Change to entry display, approving an entry and start calibration.
	The ESC button is used to delete an entry of a value, or to leave a given display and go to the preceding display. Repetitive pushing will always result in the showing of the work display.

9.1.3 Display buttons with LEDs.

	Display change to showing the rpm of the rotor. When the display is active, the LED will light up.
	Display change to showing the knife setting entered. When the display is active, the LED will light up. Possibility for changing the knife setting.
	Display change to display for oil heating. When the display is active, the LED will light up. A new push which is held for two seconds will start the heating of the oil. The oil heating will only start if the oil temperature is lower than "Temp. Oil Heating" or if a sensor has not been put in. If a sensor has been put in, the oil temperature will be shown. If a sensor has not been put in, the time from the start of heating will be shown in minutes. When the oil is heating an LED will blink. The oil heating will stop when the temperature reaches "Temp. Oil Heating". Or by pushing the button again.
	Display change to showing the rpm of the rollers. When the display is active, the LED will light up. If the control is put in reverse, an LED will light up no matter which display is showing in order to indicate that the rollers are in reverse. If the percentage difference between the rollers is larger than the entered value, the LED will blink no matter which display is shown. At the same time an alarm will sound. Not TP 250
	Display change to showing the time registered for job. When the display is active, the LED will light up. A new push will change display to showing the machine's total time. Push ENTER in for two seconds.
	Display change to showing oil temperature. When the display is active, the LED will light up. If a sensor has been put in, the current temperature will be shown. If a sensor has not been put in, and "Temp. Oil Heating" is smaller than 99 the error message "Sensor error" will be shown. If a sensor has not been put in, and "Temp. Oil Heating" is 99 the message "Sensor not installed" will be shown.


9.1.4 Switch for machine operation



	<p>The switch will move to the middle position when it is not being pushed.</p> <p>Switch up is not an issue on this type of machine.</p> <p>A short push down will entail the rollers reversing the number of pulses which have been set in the control.</p> <p>Holding the switch down entails the rollers reversing while the switch is held down.</p> <p>For both functions an alarm will also sound.</p>
---	---


9.2 Functions


An overview over the control's display can be found in appendix 1; User display. An overview over every display can be found in appendix 2; Description.



9.2.1 General display showings and button functions

If "ENTER" is shown on the display it means that  must be pushed down for two seconds in order to get access to changing values or to activate underlying displays.

A blinking value means that the value can now be changed with  and .

 always brings the previous display back and in the end will show the work display.

If a value is blinking and you do not want to change this value then just push , then the display is left without the value being changed.

in order to get access to the machine's functions and setup, a code has to be entered. The access to entering the code is gained by pushing the  and  buttons and holding them in for two seconds, then this display is shown.

Machine setup
Code 0

User codes are code 3 and code 5.

Code 3 gives access to machine setup.

Code 5 gives access to calibration of the rollers. (not relevant for this type of machine).

Machine setup

Enter code 3 in the code entering display. Then the following display is shown with the possibility to change the different machine parameters:

- The rpm of the rotor where the retraction of the rollers starts

RPM start
1000 ENTER

- The low rpm of the rotor where the retraction of the rollers stops

RPM Stop
850 ENTER

- Number of pulses the rollers reverse when they are stopped because of low rpm of the rotor.

On the TP 250, the rollers do not reverse, value = 0.

Pulses Reversing	
15	ENTER

- Minimum temperature for starting the retraction of the rollers.

Temp. Oil Heating	
20 C	ENTER

9.3 Setting roller speed.



Regulation by adjusting the flow valve (see fig 12).

The speed of the rollers must be set according to the current position of the knives, cf. the table below.

Position Model	Rotor Rpm	8 mm	10 mm	12 mm	13 mm	15 mm
TP 270 PTO K	1000	42	52	62	-	78

Alternatively the current roller speed can be seen directly in the display on the PILOT K.

After setting the position of the knives on the PILOT K, the following is done:

Push  and  at the same time and the following display will be shown:

V0 states the calculated roller speed.

Ro:	0	0:	0:1000
V0:	28	V1:	0
		V2:	0

V1 / V2 states the current roller rpm. Notice that the rotor rpm must be over RPM Start or the rollers will not turn.

A roller alarm is tied to this display. The roller alarm is activated if V1 or V2 is greater than V0. This can be used for setting the roller rpm. The roller alarm will sound with 2 second intervals. At the same time the LED will blink at the button with the roller symbol.

9.4 Alarms

Alarms are always activated with sound.

There are alarm for:

- Temperature sensor fault.
- Temperature too low.
- Temperature too high.
- Too big difference on the rpm of the rollers.
- Both rollers are stopping.
- Manual reverse of rollers.
- Manual open rollers.

Temperature alarms and roller alarms are sounded with 5 beeps.

Manual reverse and manual open rollers are sounded with 2 beeps.

9.5 Comments

Pay attention to not performing welds on the machine where the control is mounted, without disconnecting all cables, power supply, sensors, communication etc. from the control, and it is recommended that the ground cable for the welder is put in the near vicinity of where the welding is going to take place. If these recommendations are not followed, the control can suffer irreparable damage.

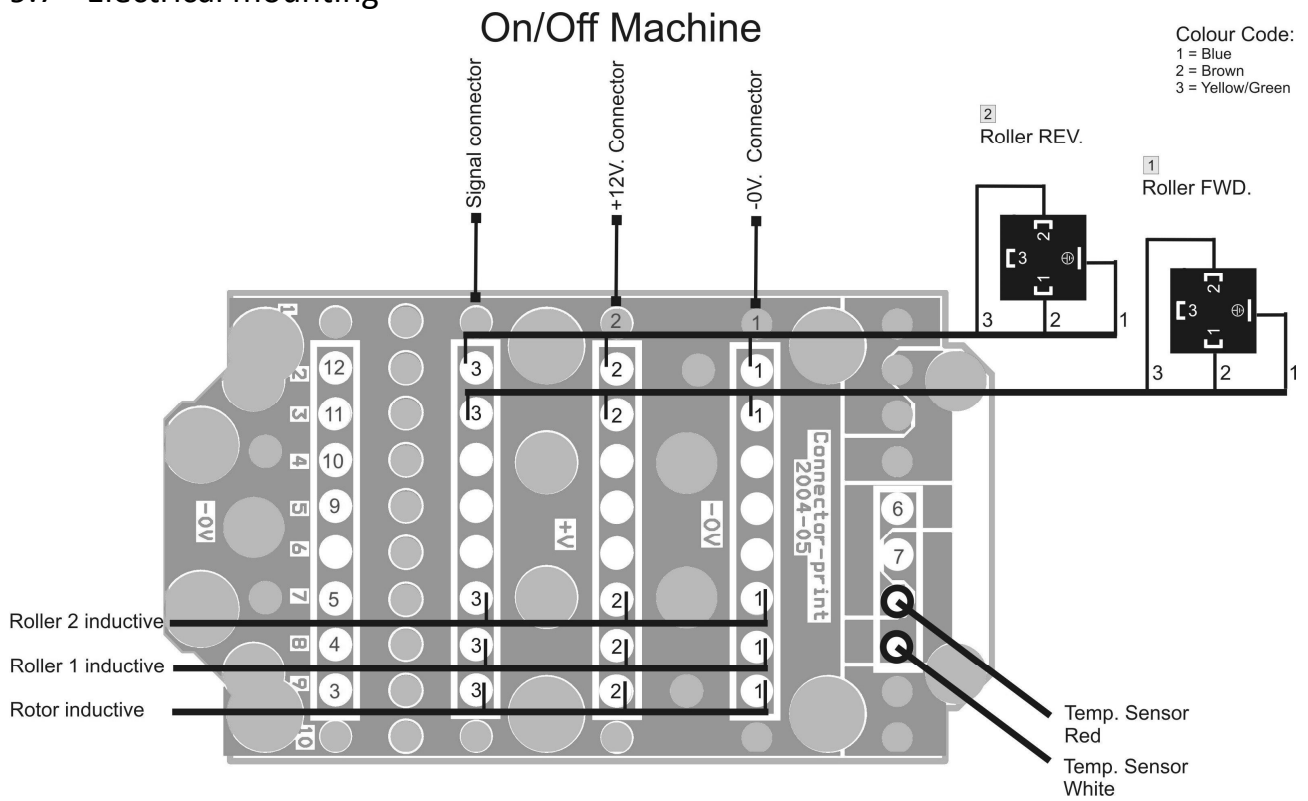
9.6 Technical data

Power supply +12V dc

Temperature range 0°C – 50°C

Fuses T3,2A/250V

9.7 Electrical mounting

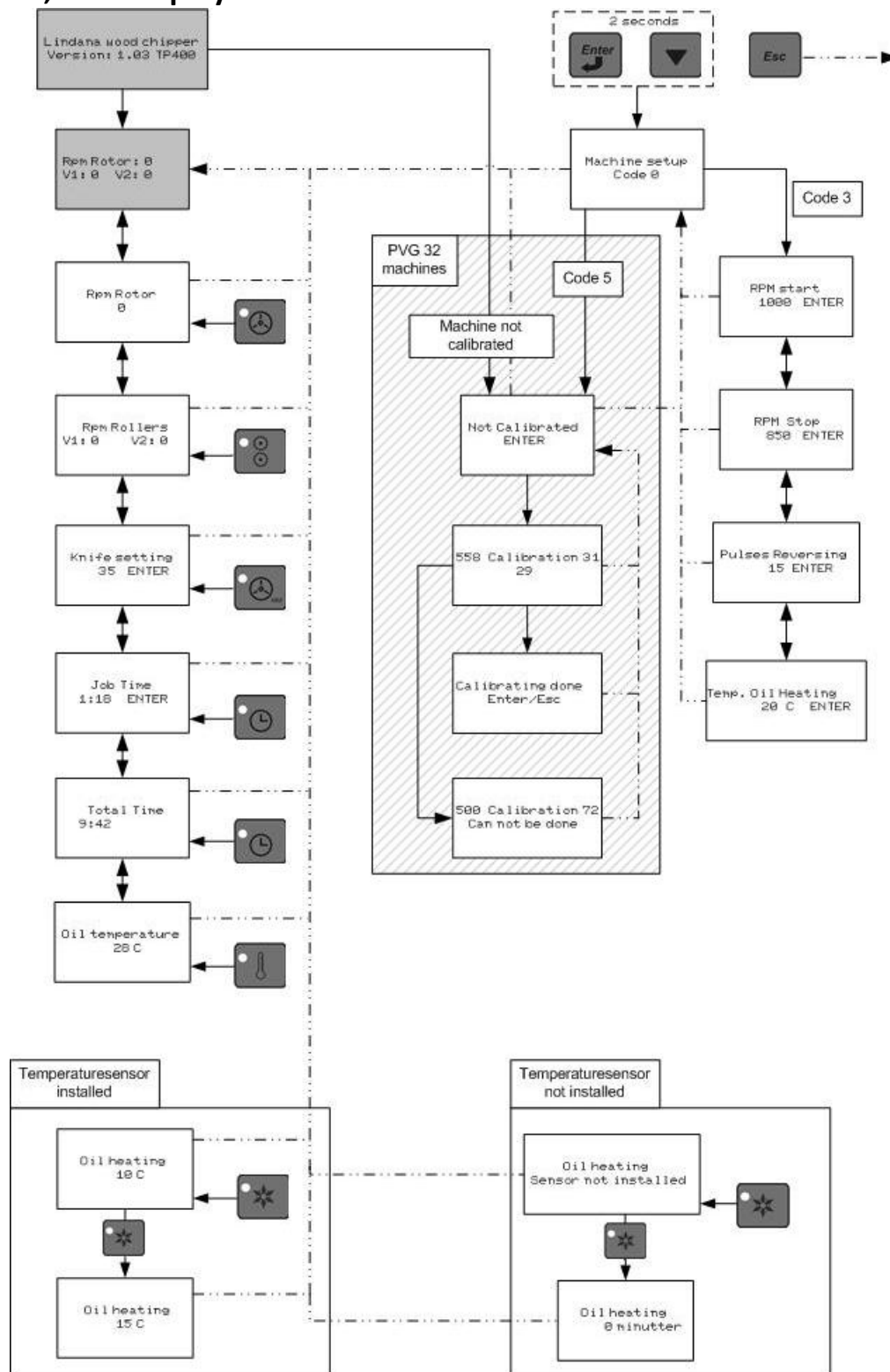


External functions



9.8 Appendix

Appendix 1; User display



Appendix 2; Description of user display.

Start display.

Display	Description
Lindana wood chipper Version: 1.15 TP270	Information: Shows the software version as well as machine type.

9.8.1 Work displays.

Display	Description
Rpm Rotor: 0 V1: 0 V2: 0 Rpm Rollers (TP 250)	Information:(Main display) Current rpm on rotor. Current rpm on roller 1 and roller 2. Current rpm on rollers.
Rpm Rotor 0	Information: Current rpm on only the rotor. Can be used if this information is overwritten by fault messages in the main display.
Rpm Rollers V1: 0 V2: 0 Rpm Rollers (TP 250)	Information: Current rpm on only the rollers. Can be used if this information is overwritten by fault messages in the main display.
Knife setting 15 ENTER	Information: Knife setting in mm. Can be changed by holding the enter button in for two seconds.
Job Time 0:16 ENTER	Information: Current job time in hours and seconds. The job time is only registered when the rollers are running. The job time can be reset by holding the enter button in for two seconds.
Total Time 0:16	Information: Show the machine's total work time in hours and minutes. The total time is only registered when the retract rollers are running.
Oil temperature 26 C	Information: The current temperature of the hydraulic oil in Celsius.
Oil temperature Sensor not installed	Information: The sensor is not put in and "Temp. Oil Heating" is set for 99.
Oil heating 10 C	Information: The current temperature of the hydraulic oil in Celsius.
Oil heating Sensor not installed	Information: The sensor is not put in and "Temp. Oil Heating" is set for 99.

Display	Description
Oil heating 10 minutes	Information: The sensor is not put in and "Temp. Oil Heating" is set for 99. Shows how long the oil heating has been activated.

9.8.2 Machine setup (code 3).

Display	Description
Rpm start 1000 ENTER	Information: Rotor rpm for start of retraction.
Rpm Stop 850 ENTER	Information: Value of stop for retraction at too low rotor rpm.
Pulses Reversing 15 ENTER	Information: Desired number of pulses the rollers should reverse.
Temp. Oil Heating 26 C	Information: The temperature the oil must have before start of retraction is started. This value must be set at 99 if the sensor has not been put in.

10 Troubleshooting for wood chipper TP 270

(all models)

Check possible causes before contacting the distributor.

Problem / Possible cause	Solution
The rollers are not spinning satisfactorily: <i>Not enough oil in the hydraulics system</i> <i>The flow valve is screwed out too far</i> <i>The stationary roller is blocked</i> <i>The bypass valve is dirty</i> <i>The revolution guard is blocking</i> <i>The operation bow is in the 0 position</i>	Fill up with hydraulic oil Turn up the flow Clean under and behind the roller Clean the bypass valve Increase the rpm on the rotor Put the operation bow in the A position
The rollers are not pulling satisfactorily: <i>Not enough flow</i> <i>The V-belts are too slack</i> <i>The hydraulic oil gets too hot</i> <i>Too poor viscosity of the hydraulic oil</i> <i>The hydraulic filter is clogged</i> <i>The oil pump is worn or damaged</i> <i>The oil engine is defective</i> <i>The pressure control valve in the control valve is dirty</i>	The flow valve is turned (opened) Tighten the V-belts Let the machine cool down while checking why Change the hydraulic oil Change the hydraulic filter Change the hydraulic pump Change the oil engine Clean the pressure control valve
Chip quality is not satisfactory: <i>The knives are dull</i> <i>The anvil is worn</i> <i>The knives are worn too far down</i> <i>The distance between knife and anvil is too big</i> <i>Sliver breaker not mounted or worn</i>	Grind the knives Turn/change the anvil Change the knives Adjust the distance between the knives and anvil Mount or change the sliver breaker
Poor ejection of the chips: <i>Not enough drive</i> <i>Scrapers are worn</i> <i>Ejector wings are worn</i> <i>The facing plate in the top part</i> <i>Not enough revolutions on the machine</i>	Not enough effect on the PTO axle or the engine Change the scrapers Change the ejector wings Remove the facing plate in the top part Increase speed to maximum revolutions

11 Warranty obligation for wood chipper

The warranty is valid 12 months from date of purchase to rectify defects that irrevocably are due to defects in materials or workmanship. The warranty covers faulty components which are repaired or replaced.

Transportation costs and wages for changes are the responsibility of the customer.

Upon any claims, the changed parts must be sent to Linddana for investigation.

Linddana alone decides whether the claim can be approved.

The following is an excerpt from Linddana's Terms of Sales and Delivery (item 4 and 5).

Claims

Any and all risk concerning the goods is passed to the buyer at the time of delivery of the goods. A claim concerning the goods has to be done in writing to Linddana as quickly as possible, and no later than 8 days after delivery. If Linddana has not received the claim before the deadline stated, the objections to quantity and quality that the buyer might have will lapse.

Linddana is entitled and obligated to correct any and all faults which are caused by the construction, material or manufacture. Linddana alone determines whether the remedy is to be done with repairs or changes of the defective parts. In case of repairs, the buyer is obligated to deliver and collect the goods sold in the workshop determined by Linddana at no expense to Linddana. In case of changing the defective parts, the buyer is obligated to send in the defective parts to Linddana at no expense to Linddana. Linddana is entitled to changing the defective goods.

Linddana's responsibility only covers faults which occur within a year of the goods sold being delivered.

Linddana has no liability besides those stated in the present item. This includes any loss the fault might cause including loss of work, loss of earnings and other economical implication losses.

Warranty conditions

If Linddana has decided to grant a warranty, then this has faults in the construction, material or manufacture. A warranty granted by Linddana does not cover faults which occur as a result of imperfect maintenance, incorrect mounting, changes made by the buyer or wrong use of the good. The warranty furthermore does not cover normal wear and tear or deterioration. Linddana's warranty obligation presupposes that the buyer documents that a stated fault is not due to the conditions which are exempt from the warranty cf. afore-mentioned.

The buyer must let Linddana know in writing about any faults to the goods sold no later than 8 days after the fault should have been realized by the buyer. If the buyer does not let Linddana

know before the expiration of this deadline and before the warranty period runs out, the buyer loses the right to make any claims concerning the fault.

Linddana is entitled and obligated to remedy any faults which are covered by a warranty granted by Linddana. Linddana alone decides if the remedy is to be done as repairs or changes of the defective parts, everything under the terms stipulated in item 4.

Linddana has no other liability for those faults. This includes any loss the fault might cause including loss of work, loss of earnings and other economical implication losses.

The warranty does not cover:

- If a defect with just cause can be attributed to inappropriate use.
- Use of unoriginal spare parts, including worn parts.
- Wrong adjustment or use of the machine.
- Use of wrong lubricant or hydraulic oil.
- Wear on cross at PTO axle.
- Tightening spring for rollers.
- V-belts.
- Knives and anvil which break because of foreign bodies in the machine.

12 Technical data wood chipper

Type	TP 270 PTO	TP 270 PTO K
Chipping principle	Disc chipper	Disc chipper
Rotor disc diameter, mm	960	960
Number of revolutions PTO rpm*	1000	1000
Knives, pieces	3	3
Effect need min/max kW/(HP)	75-150/(100-200)	75-150/(100-200)
Max. Wood diameter, mm	270	270
Chip length, mm	11-21	11-21
Weight, kg	1370	1350
Height, mm	2980	1404 + *
Width, mm (work position)	2405	1980
Length, mm (work position)	2485	1972
Figure nr.	26	27

* Ejector tube.

PTO transmission axle: Walterscheid type 2400 with free running and friction coupling.

Rights to changes in the construction and specifications without previous notice reserved.

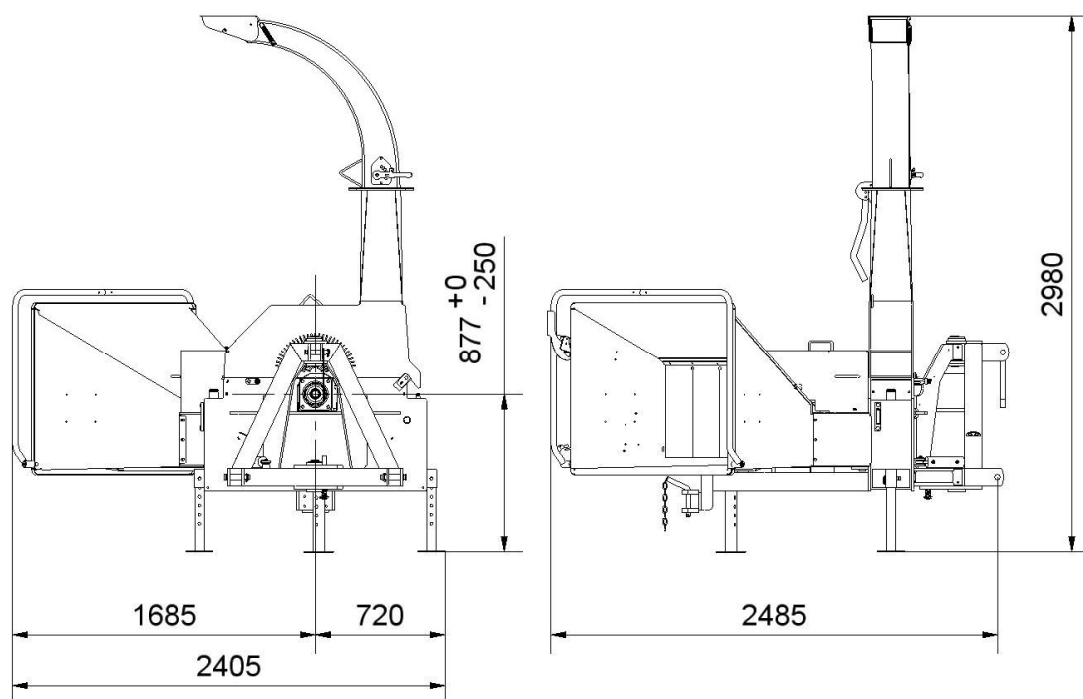
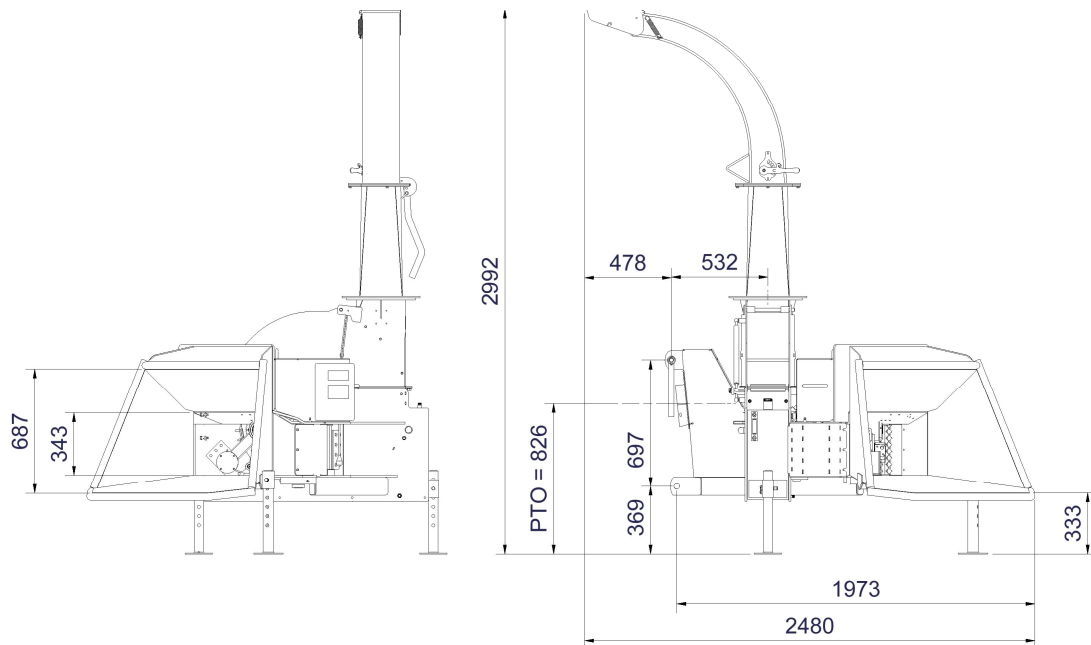


Figure 26 Dimensional sketch TP 270 PTO



Figur 27 dimensional sketch TP 270 PTO K

13 Hydraulics diagrams

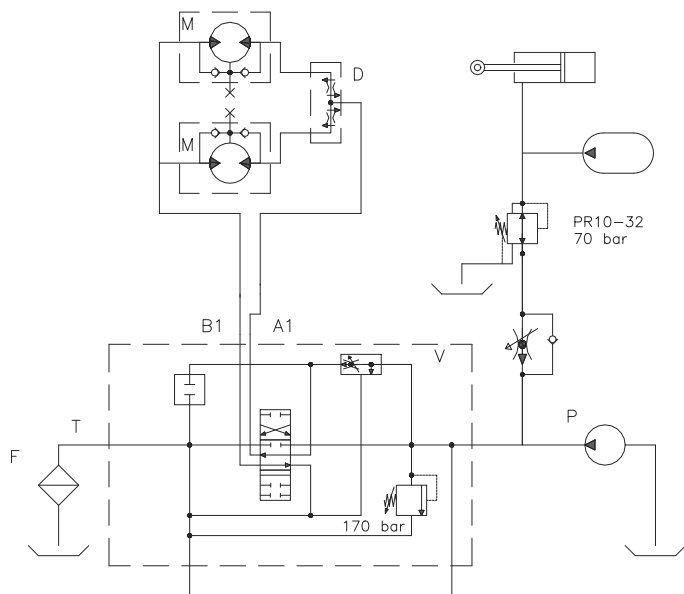


Figure 28 Hydraulics diagram TP 270 PTO

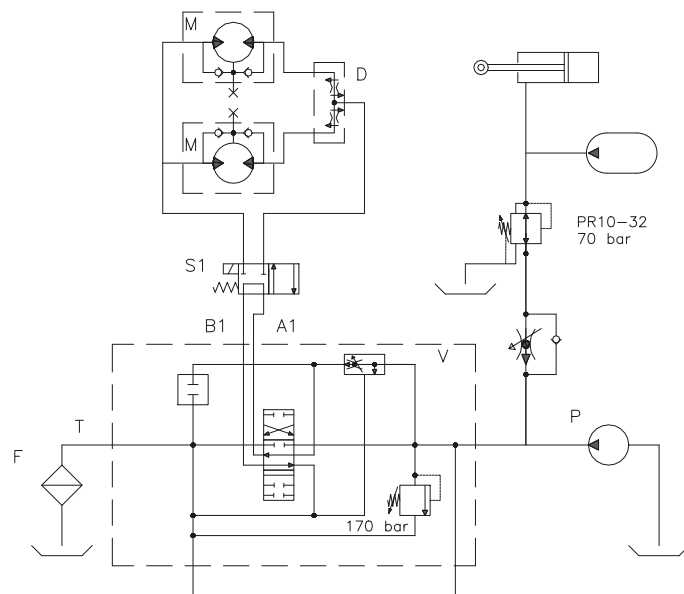


Figure 29 Hydraulics diagram TP 270 PTO with TP PILOT

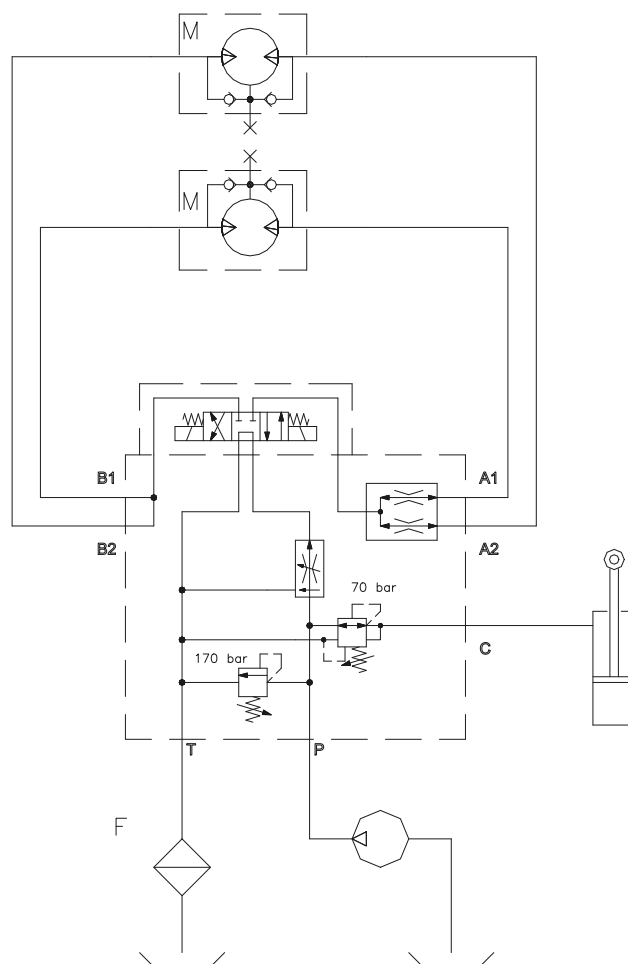


Figure 30 Hydraulics diagram TP 270 PTO K

14 Accessories

- Revolution guard TP PILOT
- Tool kit incl. torque wrench.
- Prolonged ejector tube horizontal.
- Extension for ejector tube vertical.
- Sliver breaker type B (See Figure 19)

15 Spare parts catalogue